



CORR Insights

CORR Insights®: Acetate Templating on Digital Images Is More Accurate Than Computer-based Templating for Total Hip Arthroplasty

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Where Are We Now?

Preoperative templating is an important step in planning for THA. The goals of templating are to predict the femoral and acetabular implant size, orientation,

position, and any expected change in leg length and offset. Since the radiograph cassette is positioned adjacent to the soft tissues posterior to the hip, the anteroposterior radiograph image of the hip is magnified by approximately 20% depending primarily on the distance from the hip joint to the radiograph cassette [1]. Although radiographic magnification can vary, it can also be more-accurately quantitated with use of a radiographic magnification marker placed at the level of the femur [6]. Since translucent acetate templates generally only came in one size (adjusting for enlargement by approximately 20%), this approach could introduce inaccuracy in preoperative templating. However, the implementation of digital radiographic systems in many hospitals and health care facilities has essentially eliminated the use of printed radiograph films. This has resulted in

considerable cost savings due to elimination of printed radiograph films and storage, easy access to images by multiple health care providers, and availability of radiographs in the electronic record.

Digital templating software permits variable magnification to accurately correlate the dimensions of the projected radiograph image with the template, and minimizing the inaccuracies introduced into templating by variations in patient positioning when hard-copy radiographs were taken. Multiple studies [2, 4, 5] have shown favorable accuracy with digital templating for THA. However, digital templating requires use of software systems with each manufacturer's implants installed on multiple workstations where templating will be done, and requires time and training to use properly. The costs of digital templating systems often are paid by orthopaedic practices, which in general have not benefited from the savings that have accrued to hospitals when those hospitals switched to digital radiography from printed radiographs.

This CORR Insights® is a commentary on the article "Acetate Templating on Digital Images Is More Accurate Than Computer-based Templating for Total Hip Arthroplasty" by Petretta and colleagues available at: DOI: 10.1007/s11999-015-4321-y.

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Where Do We Need To Go?

The templating method described by Petretta and colleagues uses traditional acetate templates on digital radiograph images. The fundamental difference between this method and traditional templating on printed radiographs is that the digital image which has variable magnification is enlarged or reduced in size to match the fixed magnification of the acetate template. It is not surprising that the authors found a high level of accuracy with their method while avoiding the costs associated with a digital templating system. Templating was also done in less time than digital templating. The method described by the study authors is a viable alternative to digital templating which likely will have a role at hospitals and practices that cannot or choose not to pay for digital templating systems, which may cost more than USD 20,000 per computer workstation [3]. Findings from this study also indicate that there is a need for more user-friendly and less-expensive digital templating systems.

How Do We Get There?

The current study demonstrates that acetate templates should not be abandoned and need to continue to be provided to surgeons by implant manufacturers. However, certain benefits of digital templating such as the production of a permanent record of the preoperative plan which can be viewed electronically by different members of the surgical team are not reproduced by acetate templating on digital images. Digital templating software can be purchased for use with multiple implant systems or provided by each manufacturer for their specific implants. This implies that there is a need for more user friendly and less expensive digital templating systems. As computer graphics have advanced considerably in recent years and computer hardware costs have decreased, application of newer technology may ultimately provide the solutions needed to achieve more efficient and lower cost systems than currently available for digital templating in THA.

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